**Small Business Innovation Research/Small Business Tech Transfer**

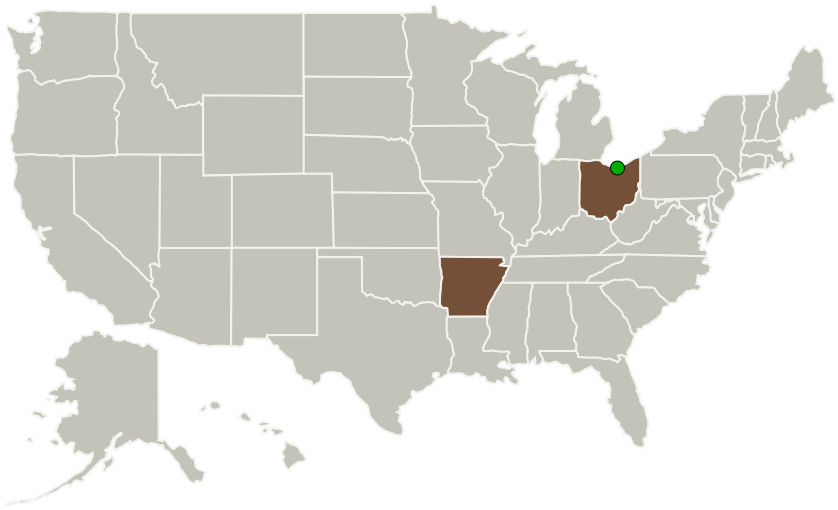
# Silicon Carbide Based Power Mangement and Distribution for Space Nuclear Power Systems, Phase I

Completed Technology Project (2011 - 2011)

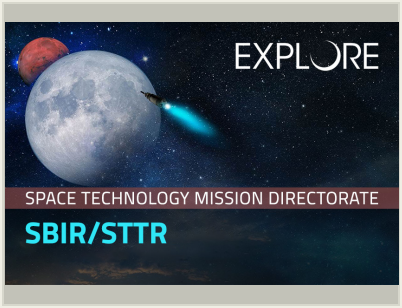
## Project Introduction

In this SBIR project, APEI, Inc. is proposing to develop a high efficiency, rad-hard, 100's kWe power management and distribution (PMAD) system for space nuclear power systems. The PMAD will utilize SiC JFET power switches; components which APEI, Inc. has irradiated under TID conditions to greater than 3MRad with little to zero change in device performance. The PMAD will implement a modular approach in order to increase efficiency and ease expansion, as well as a multi-level soft-switching power topology which will allow increased transmission voltages (up to 2 kV) and increased efficiency. APEI, Inc. will leverage over a decade of experience in developing high-power, high-density SiC-based power electronic systems in order to realize an efficient, power-dense PMAD solution for space nuclear power systems.

## Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Arkansas Power Electronics International, Inc. | Lead Organization | Industry | Fayetteville, Arkansas |
| Glenn Research Center(GRC) | Supporting Organization | NASA Center | Cleveland, Ohio |

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| Primary U.S. Work Locations | |
|---|---|
| Arkansas | Ohio |

## Project Transitions

**February 2011:** Project Start

**September 2011:** Closed out

**Closeout Summary:** Silicon Carbide Based Power Mangement and Distribution for Space Nuclear Power Systems, Phase I Project Image

**Closeout Documentation:**

- Final Summary Chart Image*(https://techport.nasa.gov/file/138499)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Arkansas Power Electronics International, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

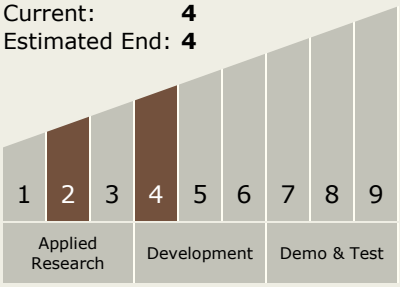
Carlos Torrez

**Principal Investigator:**

Bradley Reese

## Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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## Technology Areas

**Primary:**

- TX03 Aerospace Power and Energy Storage
  - TX03.3 Power Management and Distribution
    - TX03.3.1 Management and Control

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System